Potential Lifetime of Underground Coal Mine
Main Ventilation and Longwall Bleeder Shafts

To maintain safe working conditions at gassy underground coal mines, large-diameter (e.g., 4 to 10 feet) main mine ventilation shafts are employed to exhaust accumulated methane and dust from the mine workings. In addition, some mines also use smaller-diameter (e.g., 1 to 8 feet) bleeder shafts to increase ventilation at individual or groups of longwall panels. Generally speaking, the concentration of methane found in main mine ventilation air flows is somewhat lower (e.g., <1 percent) than that found in bleeder shafts (e.g.,<2 percent).

Ventilation main air shafts and bleeder shafts have a finite operational lifetime, which ceases when mining underground has advanced to the point where the mine's ventilation requirements can only be met efficiently by developing new shafts. The typical lifetime of ventilation main and bleeder shafts is important for ventilation air methane (VAM) projects because the frequency with which VAM oxidation equipment must be moved to follow the ventilation airflow affects the economics of such projects.

While main mine ventilation shafts typically are in service throughout a mine's productive life, the lifetime of any given bleeder shaft is determined by the length of time it takes to mine the group of longwall panels that it services. The longest lifetime to be expected from a main shaft would be about 25 years, because with modern mining methods most mines will be mined out in 25 years or less. Economics also would require that a main shaft lifetime normally would last at least five years. Interviews with individuals who are or have been actively engaged in the operation or ventilation of longwalls that use bleeder shafts for part of their ventilation requirements revealed that typical bleeder shaft lifetimes ranged from 1.5 years to 10 years, with most individuals reporting lifetimes in the 2- to 6-year timeframe.

The choice of a shaft for a methane oxidation experiment is clearly an important decision, and there exist several advantages and disadvantages associated with either shaft type. Typically the best bleeder sites are those where the bleeder air is above 0.6 percent methane. The characteristics of a main shaft that are favorable for a methane oxidation project are that it would be expected to have a longer life and would possibly have a more stable methane concentration than a bleeder shaft.